DOCUMENT RESUME

ED 022 685 SE 004 880

BUSINESS MATHEMATICS FOR HIGH SCHOOLS.

New York City Board of Education, Brooklyn, N.Y. Bureau of Curriculum Development.
Pub Date Feb 67
Note-80p.
Available from-New York City Board of Education, Publications Sales Office, 110 Livingston Street, Brooklyn, New York 11201 ($2.00).
EDRS Price MF-$0.50 HC-$3.28
Descriptors-*BUSINESS EDUCATION, CURRICULUM, *CURRICULUM DEVELOPMENT, *CURRICULUM GUIDES, GRADE 10, NONCOLLEGE PREPARATORY STUDENTS, *SECONDARY SCHOOL MATHEMATICS
Identifiers-New York, New York City

This curriculum bulletin in Business Mathematics is intended primarily for teachers of tenth grade pupils who are being trained for specific office and sales positions. The format of this syllabus has been organized to provide representative sample problems for each of three categories of pupils who (1) are currently functioning at an average level or pace in mathematics, (2) manifest difficulty with mathematical concepts and/or skills and are currently functioning below the average level or pace, and (3) demonstrate a keener grasp of number relationships, and currently are functioning at an above-average level or pace. The objectives of the bulletin are (1) to develop accuracy in the application of fundamental processes to the solution of arithmetic problems that the pupil will face as a businessman, an employee, or a customer, (2) to develop the pupils' understanding of the business background and of the social and economic forces implicit in the problems of this syllabus, (3) to develop facility in the use of short cuts and rapid mental calculations, and (4) to develop desirable habits and attitudes essential for success in business and every day life. (RP)

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BUSINESS MATHEMATICS

for High Schools

ED022685

SE004 880

Bureau of Curriculum Development
Board of Education of the City of New York

New York City public schools should order additional copies of this publication from the Bureau of Supplies. Order No. 00-0890-40.

Copies of this publication may be purchased by outside agencies from: Board of Education of the City of New York, Publications Sales Office, 110 Livingston Street, Brooklyn, New York 11201. Checks should be made payable to: Auditor, Board of Education. Price: $2.00

79 (PAC.)

CURRICULUM BULLETIN • 1967-68 SERIES • NO. 14

BUSINESS MATHEMATICS *for High Schools*

ED022685

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FOREWORD

Despite automation and mechanization of office procedures, the business community expects that the beginning office workers whom they recruit from among our high school graduates will have a mastery of mathematical fundamentals and their application to business problems and practices.

Similarly, the teachers of advanced business subjects require the same facility from the students whom they are training for specific office and sales positions. The course in business mathematics not only orients the student to business practice and terminology but gives him the foundation on which business skills can be built.

This course of study will help the teacher to help the student, and in doing so, help to develop the competent business workers on which the business community depends for its continued success.

HELENE M. LLOYD
Acting Deputy Superintendent of Schools

February 1967

ACKNOWLEDGMENTS

This curriculum bulletin, Business Mathematics, was developed under the direction of William H. Bristow, Assistant Superintendent, Bureau of Curriculum Development. Helene M. Lloyd, Acting Deputy Superintendent in charge of Curriculum, provided overall supervision of the project.

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Daniel A. Salmon served as curriculum coordinator for the Bureau of Curriculum Development. Aaron N. Slotkin, Editor, supervised the editing and production of this publication. Edythe Kahn edited the manuscript, Elena Lucchini collaborated in editing and was responsible for printing production, Lillian B. Amdur did the proofreading, and Simon Shulman designed the cover.

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Introduction

The preparation of a valid and effective syllabus in business mathematics to meet the needs of students must be predicated upon an appraisal of the pupils taking the course, the number of terms allowed for the course, the desirability of establishing a Regents examination objective, and an evaluation of current course offerings and their grade placement. Accordingly, a questionnaire was sent to all academic and vocational high schools and an analysis was made of the replies received from 43 academic and seven vocational high schools.

The analysis revealed that courses in business mathematics are generally given for two terms during the ninth or the tenth year. Schools vary in the composition of classes. In some schools all the pupils in business mathematics classes function below the average level in mathematical skills. In other schools only a minority perform below average. In some schools up to 20 percent of the pupils in these classes perform above average. As a general rule, however, classes are composed almost entirely of average or below-average pupils, with but a scattering of pupils functioning above the average level. Very few schools offer a course designed for the Regents examination; where it does exist, the pupils are selected.

To select topics most appropriate for the pupils of the New York City system, a committee studied the 1958 New York City Board of Education publication, "Source Materials in Ninth Grade Arithmetic," and the 1961 New York State "Tentative Syllabus in Business Arithmetic." Inasmuch as very few schools are interested in preparing for the Regents examination, the criterion for selectivity was pupil need rather than conformity with the Regents examination. It is recommended that schools preparing for the Regents examination follow the state syllabus; of course, they may consult the city syllabus for teaching suggestions on specific topics.

Because of the wide variance in pupil composition, the format of this syllabus has been organized to provide representative sample problems for each of three categories of pupils who:

1. are currently functioning at an average level or pace in mathematics
2. manifest difficulty with mathematical concepts and/or skills, and are currently functioning below the average level or pace
3. demonstrate a keener grasp of number relationships, and currently are functioning above-average level or pace.

To provide added flexibility, several topics have been labeled "optional" for students in all three categories; other topics have been omitted for pupils in category 1 and/or category 2.

The committee recognizes that the selection of topics, the time allotment, the sequence, and the treatment of topics are subject to differing experiences and judgments. Accordingly, the first draft of this syllabus was used in the schools on an experimental basis. On the basis of recommendations made by teachers and chairmen, changes were incorporated into this final draft.

The time allotment that follows is approximate. The number of lessons needed for any topic has been indicated in terms of weeks to emphasize the approximate nature of the time schedule. "One week" means that the topic will probably require from three to seven lessons; "two weeks" means from eight to twelve lessons, etc. Individual schools should adjust this time schedule to their needs.

UNIT	TOPIC	NO. OF WEEKS
	Term 1	
	Organization, orientation, diagnostic testing; review of fundamental operations	2
1	Invoicing skills; discounts; related taxes	4
2	Checkbook; bank reconciliation	2
3	Interest	2
4	Payroll	5
	Testing and review (during the term)	3
		18
	Term 2	
5	Income taxes	4
6	Insurance	3
7	Installment buying	2
8	Profit and loss	1
9	Depreciation	1
10	Stocks and bonds	2
11	Owning a home	2
	Testing and review (during the term)	3
		18

GRADE PLACEMENT

This syllabus is intended primarily for teachers of tenth-grade pupils. Counselors may program ninth-year pupils for this course in schools not offering a course in ninth-year general mathematics and may find it desirable to program certain eleventh- and twelfth-grade pupils.

Objectives

1. To develop accuracy in the application of fundamental processes to the solution of arithmetic problems that the pupil will face as a businessman, an employee, or a consumer
2. To develop the pupils' understanding of the business background and of the

social and economic forces implicit in the problems in this syllabus
3. To develop facility in the use of shortcuts and rapid mental calculation
4. To develop desirable habits and attitudes essential for success in business and everyday life.

Teaching of Fundamentals

The wide range of abilities found among pupils in any business mathematics class suggests the definite need for adapting instruction to the mean ability of the class and, at the same time, providing for individual differences.

At the start of the term, either the "New York City Arithmetic Computations Test," for which there are grade equivalents or "Appraisal of Basic Arithmetic Ability in Business Arithmetic Classes," for which there are percentile equivalents (see State Business Arithmetic Syllabus), may be used to determine the ability of the group and of the individual pupils. Either test may be administered in one period. The same test, in a different form, should be given toward the end of the term to determine the extent of and areas of progress.

A knowledge of fundamentals of arithmetic is basic to problem solving. Many pupils enrolled in business mathematics courses are seriously retarded in their ability to handle these basic operations. It is important to note that the need for appropriate, motivated, and meaningful drill is never-ending.

It should be recognized that a knowledge of fundamental operations, in itself, has limited value until such knowledge is applied to practical business and life situations. In addition, pupils are more anxious to learn when they recognize the need to understand fundamentals in order to solve business problems. The committee feels that the most valuable procedure for reviewing fundamentals, therefore, is to include appropriate drill or review as part of the regular daily lesson; that the major, if not exclusive, emphasis should be on that type of fundamental operation which will be used in solving the business problems to be taken up during the lesson. It is for this reason that less than two weeks has been allotted for review of fundamental operations at the start of this course.

Generally, the review of fundamentals should be a part of each daily lesson and should be written on the board before the start of the lesson as a "Do Now" assignment while the teacher checks attendance, returns homework papers, etc. The drill should be limited to 2-4 minutes with 1-2 minutes for checking answers.

The class drill may be limited to one operation pertaining to the lesson of the day, as shown—

$.25 = _____\%$
$.14 = _____\%$
$.07 = _____\%$
$.175 = _____\%$
$.12\frac{1}{2} = _____\%$

The homework assignment may include a number of different examples involving fundamentals previously studied, as shown—

Divide 323 by 17
Add 2.3 and 3.45
Find 2% of $150
What is 2/3 of $24?

Caution should be exercised in planning these short reviews so that they do not extend to 10-12 minute projects that will encroach on the time needed to complete the planned lesson. The opening drill should be simple enough so that the great majority of pupils will encounter no undue difficulties. When, in the judgment of the teacher, the fundamental operation presents difficulties for many pupils, the review should not be given as a "Do Now" assignment but should be given adequate treatment as part of the lesson itself.

During the first two weeks and throughout the term, the review of fundamental operations should cover the following areas, with the sequence to be determined by the teacher.

WHOLE NUMBERS
Reading
Rounding off
Fundamental operations:
  Addition, subtraction, multiplication, division

FRACTIONAL NUMBERS
Meaning
Fractional equivalence:
  Changing to higher or lower terms
Fundamental operations
Conversion of mixed numbers to improper fractions
Conversion of improper fractions to mixed numbers
Conversion of fractional numerals to decimal form
Conversion of fractional numerals to percents

DECIMAL FRACTIONS
Meaning
Rounding off
Fundamental operations

DENOMINATE NUMBERS
Linear
Square (area)
Avoirdupois
Liquid
Time

PERCENTS
Meaning
Conversion to decimals
Finding a percent of a number
Finding what percent one number is of another
Use of percents greater than 100%
Use of percents less than 1%

Pupils should be trained to acquire a number sense and an understanding of number relationships. Questions such as the following may be posed:
1. 15 is how much greater than 5? How much less than 15 is 5?

2. 5 x 3 = 3 x ———?
3. Arrange in descending order: ¾ 5/10 ⅜ 1½
4. Arrange in ascending order: .7 .777 7.7 7.007 .07
5. Which of the following are greater than 60%? 4/5 5/6 ⅔ 2/5 ⅜
6. What is the place value of 6, according to its position, in each of these numbers: 296 65 625 6100

The following shortcuts are suggested:

1. Multiplication and division by 10, 100, 1000.
2. The one-step method in multiplying by 11 and 12.
3. Short division of whole numbers when the divisor is 12 or less.
4. Conversion of a common fraction to its decimal form in multiplication and division of mixed numbers.
5. Application of the commutative law in multiplication.
6. Elimination of zeroes at the right, in the divisor.
7. Elimination of zeroes at end of a decimal when multiplying.
8. Use of simple aliquot parts of 100 in multiplication.
9. Combination of adjacent numbers, totaling 10, in addition.

ARTICULATION WITH THE LOWER GRADES

Business mathematics is, essentially, mathematics applied to business situations. It should be obvious, therefore, that the teacher of business mathematics should have a thorough knowledge of the content and methodology of the mathematics taught in earlier grades. Thus, the methods and algorithms he uses in reviewing the fundamental operations and in applying mathematical procedures to the solution of business problems will conform with those taught to students in preceding grades.

An excellent reference for the teacher of business mathematics is "Mathematics: Grade 7" (Curriculum Bulletin No. 3, 1966-67 Series). This bulletin contains many valuable suggestions for teaching the fundamental operations and shows, in great detail, how pupils have been taught to solve problems. Additional references are listed at the end of this syllabus.

The teaching of mathematics in the elementary and junior high schools is currently undergoing tremendous change. Some of the terminology and concepts of the "new mathematics" will be brought by students to the business mathematics classroom in the next few years. The curriculum bulletins, "Mathematics: Grade 7" and "Mathematics: Grade 8" (to be issued at a later date) incorporate these new concepts and should be studied by the teacher of business mathematics. In particular, he should be familiar with the following:

1. Numeration systems used by ancient civilizations (to understand our own system better and to appreciate the advantages of our system)

2. Numeration systems with bases other than ten, including the binary system (to appreciate our base 10 system and to understand the mathematics used by electronic computers)
3. Terminology used in the new mathematics to describe basic principles:
   a. Commutative property of addition: $2 + 3 = 3 + 2$
   b. Commutative property of multiplication: $2 \times 3 = 3 \times 2$
   c. Associative property of addition: $(2 + 3) + 4 = 2 + (3 + 4)$
   d. Associative property of multiplication: $(2 \times 3) \times 4 = 2 \times (3 \times 4)$
   e. Identity element for addition: $3 + 0 = 3$
   f. Identity element for multiplication: $5 \times 1 = 5$
   g. Distributive property of multiplication over addition: $2 \times (3 + 4) = (2 \times 3) + (2 \times 4)$
   h. Subtracting and dividing as inverse operations of adding and multiplying, respectively
4. Use of these mathematical principles to explain fundamental algorithms and operations. For example, 26×5 is equivalent to $(20 \times 5) + (6 \times 5)$.
5. Terminology used in the new mathematics to improve precision of meaning
   a. Distinction between "number" and "numeral": the "number" is the abstract concept, while the "numeral" is the symbol. Thus, the concept of eight may be expressed by various numerals: 8, 16/2, 80/10, VIII, etc.
   b. A number which can be expressed in the form a/b, where a and b are integers and b is not equal to zero, is called a rational number; examples: ¾, 2 (2/1), 1.5 (15/10), 6/5.
6. Use of the number line to visualize or to graph numbers

CLASSROOM INSTRUCTION

Business Mathematics Lessons

The DEVELOPMENT LESSON should show (as a minimum)

1. The aim of the lesson
2. Brief review of fundamentals, e.g., "Do Now" exercise
3. Motivation that will bring out the need for learning the new topic
4. The demonstration or developmental problem to be discussed and solved
   a. Problem should be copied in pupils' notebooks
   b. Model solution should be developed at the board by the teacher with pupils copying the model in their notebooks
5. Drill material (problems of a similar nature to be solved by pupils at desks and at boards)
6. Application to varied and related problems
7. Summary
8. Homework assignment

The DRILL AND REVIEW LESSON should indicate (as a minimum)

1. The aim of the lesson
2. Brief review of fundamentals
3. Review of previous day's work, including homework at the board
4. Additional drill problems, graded as to difficulty (new terms and variations required by certain problems should be discussed)
5. Provision for individual differences; small group instruction when practicable
6. New homework assignment

Problem Solving

A. Help the students understand the problem. (Use their experiences.)
   1. Discuss the meaning of business terms used.
   2. Have students state: What is the first step?
      What is the second step? Etc.
B. Give pupils time to think. Encourage questions.
C. Estimate the answer whenever practicable.
D. Solve the problem. Use a prescribed format which should become habitual with frequent use.
   1. All computations should be shown in the solution. (Scrap paper should not be used.)
   2. All important figures should be labelled clearly.

SUGGESTED FORMAT FOR HOMEWORK AND CLASSWORK: A one-inch margin at left for recording page and problem number; and a one-inch margin at right for indicating final answer. The continued use of this format will instill in pupils an appreciation for a systematic and orderly arrangement of work and, at the same time, enable the teacher to appraise the work quickly for completion and accuracy.

PROBLEM	PROBLEM	ANSWERS
#239/5	A coat sells regularly for $79.00. During a special sale, a discount of 15% is allowed. What is the price of the coat during the special sale?	$67.15
	Given Regular Price $79.00 Discount 15% **Find** The Reduced Price.	**Solution** $79.00 Regular Selling Price — 11.85 Special 15% Discount 67.15 Reduced Price **Calculations** 15% = .15 $79 Old Price x .15 Discount Rate 395 79 $ 11.85 Discount	$67.15

E. Verify the answer.
   1. Common-sense check as to reasonableness of answer.
   2. Arithmetic proof of accuracy. Compare answer with estimate.

Drill

A. For drill purposes, it is desirable to use the same type of problem until the procedure for solving the problem has been mastered. A time-saving method of writing drill problems on the board might be to write them in tabular form:

	Old Selling Price	Discount Rate	New Selling Price
#1	$200.00	25%	?
#2	450.00	15%	?
#3	97.50	40%	?
#4	49.95	8%	?
#5	299.00	7½%	?

B. A series of problems on one topic should be graded as to difficulty. The problem used in the development of the topic and the first few drill problems should be relatively simple so that arithmetic difficulties will not interfere with the mastery of the procedure to be used. As the procedure and method are mastered, problems should require greater computational skill.

SUGGESTIONS FOR THE TEACHER

A. Mechanize routines to save time. For example, when homework or test papers are to be collected, have pupils write their row numbers in the upper right-hand corner of the paper to expedite the return of papers. Write the new homework assignment on the board, in the same place each day, before the start of the lesson.

B. Inspect homework regularly for completion, form, arrangement, neatness, and accuracy. Do this in class during the opening drill exercise, or collect the homework.

C. Have pupils write the homework solutions on the board at the beginning of the period or use a prepared transparency solution. Check several problems in detail as a review but do not spend too much time on checking additional problems that are identical in nature with the one or two that were discussed thoroughly. Merely call for the answers to these additional problems and go on with the lesson.

D. When practicable, the Do-Now problems referred to under "Teaching of Fundamentals" should embrace the arithmetic principles to be used in the subsequent part of the lesson.

E. In presenting a new topic, the entire business background of the subject need not be presented the first day, for sufficient time may not remain for the arithmetic phase of the lesson. Judiciously select those business facts that are needed for appropriate motivation and understanding of the new topic. On subsequent days, introduce additional background information and enrichment.

F. To provide for skill retention in problem solving or in computational skill, the current homework assignment may include one problem taught earlier in the term. Similarly, a test on a current topic may include one problem on an earlier topic.

G. Sometimes it is desirable to notify the class in advance that a specific earlier topic is to be included in the current test. This approach will encourage pupils to review the topic independently.

H. Instill habits of neatness and orderly arrangement by insistence on
   1. Good form and correct placement of figures
   2. Uniformity in the use of algorithms
   3. Uniformity in the arrangement of the solution
   4. Imitation of good chalkboard models

I. Oral solution of simple problems should precede the written solution of more difficult problems of the same type.

J. Rationalize rules and formulas whenever practical. For example, explain the basis for the rule—"to find the interest for 60 days at 6%, point off two places to the left."

K. Bring to class: invoices, statements, cancelled checks and bank statements, newspaper advertisements, tax forms, etc., as motivational material to illustrate practical value of the topic under discussion.

L. There is an abundance of sample problems in this syllabus for pupils who can proceed at an average, modified, or accelerated pace. It is not intended that instruction shall be limited to these problems, nor that the teacher must use each type of problem in every class. For example, in some schools, special classes are formed for general course pupils; "Modified Pace" problems may be the most suitable ones to use in these classes. In other schools, no such grouping is made, and "Average Pace" problems may be more suitable; here "Modified Pace" and "Accelerated Pace" problems may be given to individual pupils or to groups of pupils.

TERM ONE

Content	Teaching Suggestions
INVOICING SKILLS	Apply to practical business situations.
Business terms and denominate numbers Per C, per M, per dozen Gallons, quarts, pints Yards, feet, inches Tons, pounds, ounces, cwt.	Review division by 100 and 1000. Review writing of cents. Discuss why nine cents may be written as \$.09 or 9¢, but not .09¢.
Computation of retail invoices Extensions and additions	Use blank sales slips.
Retail sales tax New York City New York State	Discuss purpose of N.Y. sales tax and rates. Discuss nontaxable items. Use table to find tax on sales under \$1.00. Discuss sales in N.Y.C. with deliveries to customers who live outside the city.
	Discuss compensating "use tax." The sales tax is computed on the difference between the cost of the new car and the allowance on the trade-in.

SAMPLE PROBLEMS

Average Pace	Modified Pace	Accelerated Pace
Find cost of 5500 envelopes at $4.25 per M.	Find cost of 5500 envelopes at $4.00 per M.	Find cost of 12,620 envelopes at $4.37½ per M.
One dozen cans of soda cost $1.00. What would 1 can cost?	Same as Average Pace.	A quart bottle of soda costs $.24. A 12 oz. can costs $.08. Which would be the more economical purchase?
Prepare bill for sale of three shirts at $3.98 each and two neckties at $1.79 each.	Prepare bill for three shirts at $4.00 each, and three pairs of socks at $1.50 a pair.	Same as Average Pace.
Compute invoices as above and add sales tax.	Same as Average Pace.	Same as Average Pace.
Find total cost, including sales tax, of the following purchases at a super-market: 1 loaf of bread, 29¢ 2 lb. meat @ $1.15 per lb. 6 bottles of soda @ 2 for 45¢ 3 bars soap @ 15¢ ea.	Same as Average Pace.	Same as Average Pace.
Blake bought a new car in Albany for $3,300. How much is the N.Y.C. "use tax"?	Blake bought a new car in Maine for $3,300. How much is the N.Y.C. "use tax"?	Blake bought a new car in Albany for $3,300 and received a trade-in allowance of $1,150 for his old car. How much is the N.Y.C. "use tax"?

Content	Teaching Suggestions
Discounts on special sales	Use newspaper advertisements illustrating ⅓ off, 25% discount, etc.
Computation of wholesalers' invoices Extensions and totaling Single trade discounts	Use regular invoice forms. Discuss purposes of trade discounts. Use catalogs, price lists, etc. Stress that trade discounts are deducted on the invoice to determine the net selling price.
Two trade discounts	Discuss reasons for giving a second discount. Emphasize that the second discount is always based on the balance after deducting the first discount. Demonstrate applicability of commutative law of multiplication: discounts of 30% and 20% would be the same as 20% and 30%.
Comparison of multiple and single discounts	Establish that 30% and 20% are not the same as 50%, nor the same as 40% and 10%.

Average Pace	Modified Pace	Accelerated Pace
During a special sale all coats are reduced ⅓. Find cost of a coat that was marked $49.50 before the sale, plus sales tax.	Use a price of $30.	Same as Average Pace.
A store employee may buy at 15% discount. Find the cost to an employee of a dress marked $14.95.	Use a price of $15.	Same as Average Pace.
A manufacturer sells a radio for $36 less a discount of 25%. How much will a customer pay for six radios?	Find the cost of a radio that has a list price of $40, less 25%.	A camera lists for $99.50 less a discount of 33⅓%. Find the cost of twelve cameras.
A washing machine lists for $300, less 25% and 10%. What is the invoice price?	Same as Average Pace.	Find net selling price of merchandise listed at $861.60 less 30% and 15%.
Model A sells for $150, less 20% and 10%. Model B sells for $150 less 30%. a. Which model costs less? b. How much less?	Same as Average Pace.	Model A sells for $150, less 30% and 15%. Model B sells for $150, less 45%. a. Which model costs less? b. How much less?

Content	Teaching Suggestions
Finding single discount equivalent	Limit problems to two discounts; for example, to what single discount are 30% and 20% equal? Use the following suggested approaches: a. 100% —30% 70% —14% (20% of 70%) 56% Net Price 44% Discount 100% List Price b. $100 \times \frac{7}{10} \times \frac{4}{5} = 56\%$ Net Price 44% Discount 100% List Price
Cash discounts	Discuss the purposes of the cash discount.
Terms of sale	Discuss meaning of n/10; n/30; 2/10, n/30; 2/30, 1/60, n/90; 2/10 E.O.M.
Computation of discount and net payment	Emphasize the importance of the discount as a saving to the buyer if he pays promptly.

Average Pace	Modified Pace	Accelerated Pace
Find the single rate of discount equal to: (a) 20% and 20%; (b) 50% and 10%.	Omit.	Find single discount equivalent to 35% and 15%.
Goods are sold on April 20. When must payment be made if the terms are n/10? n/30? n/60?	Limit to n/10 and n/30.	Include terms such as R.O.G.; 2/10, 60 extra.
Goods are sold for $360 on Dec. 8; terms, 2/10, n/30. a. What is last day on which payment should be made? b. What is last day on which discount should be deducted? c. How much is the discount? d. How much is the net payment?	Same as Average Pace, but use $300 as the price.	Goods are sold for $841.60; the terms are 2/10, 1/30, n/60. (Word questions in a manner similar to that of Average Pace group.)

Content	Teaching Suggestions
Computation of net payment after deducting a trade discount and a cash discount	Emphasize that a trade discount must be deducted on the invoice even if no cash discount is taken.
PAYING BY CHECK Keeping the checkbook record Preparing the bank deposit	In Average-Pace classes, a checkbook of 3 checks to a page should be used and new page balance determined as each page is completed. In Modified-Pace classes it may be simpler to find new balance after each check has been drawn or each deposit made. In Accelerated-Pace classes the accumulation of total deposits and total checks, which is most desirable procedure, will serve as background for later work in bookkeeping classes. Discuss advantages of paying by check. Discuss proof of cash.

Average Pace	Modified Pace	Accelerated Pace
Goods are sold on March 27 at a list price of $1200, less 25%; terms, 2/10, n/30. What is the amount to be paid (a) on April 26? (b) on April 5?	Goods are sold for $400 less a trade discount of 25%. A cash discount of 2% is deducted. Find the amount to be paid.	Goods are sold for $480, less 33⅓% and 25%; terms, 2/10, n/30. The invoice was dated Jan. 25 and was paid on Feb. 4. Find the amount of the payment.
On May 3, Tom Brown made the following deposit in the National City Bank: 6 ten-dollar bills, 8 five-dollar bills, 4 one-dollar bills, 6 quarters, 7 dimes, 14 nickels, 8 pennies, a check for $18.50, and a check for $34.00. a. Prepare the deposit slip. b. If the cash register tape showed sales of $159.48, was the amount of the deposit correct?	On May 3, Tom Brown made the following deposit in the National City Bank: 6 ten-dollar bills, 7 one-dollar bills, a check for $18.50, and a check for $34.00. a. Prepare the deposit slip. b. If the cash register tape showed sales of $119.50, was the amount of the deposit correct?	On May 3, Tom Brown began the day with a change fund in his cash register of 10 one-dollar bills, 40 quarters, 50 dimes, 40 nickels, and 50 pennies. At the end of the day he had in the register: 25 ten-dollar bills, 15 five-dollar bills, 124 one-dollar bills, 220 quarters, 174 dimes, 89 nickels, 121 pennies, a check for $15.35, and a check for $22.10. He wishes to keep the same change fund in the register. a. Prepare the deposit slip. b. If cash register tape showed sales of $537.01, was the amount of cash correct?

Content	Teaching Suggestions
Writing checks and stubs	In Average-Pace classes and in Accelerated-Pace classes limit the writing of checks to the first page of 3 checks; thereafter prepare check stubs only. In Modified-Pace classes it may be desirable to have a second or third page of checks written for additional practice. Emphasize the importance of writing clearly. Emphasize proper spelling of numbers written as words, such as forty, eighteen, ninety. Emphasize writing of cents. After completion of the first checkbook problem, drill exercises may be used in which amounts of deposits and checks are given, and the student is required to determine the balance.

Average Pace	Modified Pace	Accelerated Pace
Tom Brown's balance in the National City Bank on Oct. 1 was $600. During the month he wrote checks and made deposits as shown. a. Enter balance on Oct. 31. b. Write stubs and checks. c. Record deposits. d. Find balance on Oct. 31. October 1 Sent check #171 to Jones Realty Co. for Oct. rent, $200.00. 2 Sent check for $8.50 to N.Y. Telephone Co. for Sept. bill. 4 Deposited $40.00. 8 Gave check for $175.85 to ABC Insurance Co. for auto insurance. 9 Sent check for $8.75 to Con Edison for electric bill. 12 Deposited $150.00. 14 Cashed check for $75.00. 24 Sent check to General Advertising Co. for advertising, $43.82. 26 Sent check to American Red Cross, $5.00.	Same problem. Write all checks.	Same as Average Pace.

Content	Teaching Suggestions
Reconciling the checkbook and bank balances Purpose of bank statement Outstanding checks Service charges Deposits in transit Certified checks	Stress reason for reconciling the balances. Discuss causes for difference between the balances. In first problem, limit application to outstanding checks; then gradually include other items listed. In Modified-Pace classes limit applications to outstanding checks and to bank charges. The first problem should be based on a checkbook prepared by student. A bank statement should be provided for each student, with a list of checks returned by bank. Problems shown are samples of problems to be considered after progressive development outlined above. Use the account form of reconciliation statement, indicating the available cash balance at end of month.

Average Pace	Modified Pace	Accelerated Pace
On Oct. 31 Alan Smith's checkbook showed a balance of $847.00; his bank statement showed a balance of $701.50. These checks were not returned by the bank: #62, $15.00; #63, $18.50. There was a bank service charge shown on the statement, $4.00. A deposit made on Oct. 31, $175.00, was not shown on the statement. Prepare bank reconciliation statement.	On Oct. 31 Alan Smith's checkbook showed a balance of $847.00; his bank statement showed a balance of $876.50. These checks were not returned by the bank: #62, $15.00; #63, $18.50. There was a bank service charge shown on statement, $4.00. Prepare bank reconciliation statement.	On Oct. 31 Alan Smith's checkbook showed a balance of $871.45; his bank statement showed a balance of $701.50. These checks were not returned by the bank: #62, $15.00; #63, $18.50. There was a bank service charge shown on the statement, $4.00. A deposit made on Oct. 31, $175.00, was not shown on statement. Check #60 for $200 had been certified but was still outstanding. Check #59 for $42 had been entered on stub as $24. No stub was written for check #57, $6.45. Prepare bank reconciliation statement.

Content	Teaching Suggestions
INTEREST	
Review calculation of interest	Stress that interest rate is annual unless otherwise stated.
For 1 year	Multiply principal by rate expressed as decimal.
For more than 1 year	Follow preceding procedure, then multiply by number of years.
For less than 1 year	Multiply principal by rate expressed as a decimal to find interest for one year, then multiply by fractional part of a year.
Finding the amount due when money is borrowed	
Calculation of interest by the 60-day method	
Interest for 60 days or 2 mos. @ 6%	Show that 60/360 or 2/12 = 1/6, and that 1/6 x 6% = 1%.
Interest for 30, 90, 15, 45 days @ 6%	Show that 30 = 1/2 x 60; 90 = 60 + 30; 15 = 1/2 x 30; 45 = 30 + 15. Provide drill for simple mental computations.

Average Pace	Modified Pace	Accelerated Pace
Find the interest on $860 for 1 year at 6%.	Same as Average Pace.	Find the interest on $736 for 1 year at 5½%.
Find the interest on $640 for 2 years at the rate of 6% per annum.	Same as Average Pace.	Find interest at 6% on $694.28 for 1 yr. 3 mos.
Find the interest on $720 for 3 months, if the annual rate is 5%.	Same as Average Pace.	Find the interest on $875 for 10 months, if the annual rate is 5%.
D. Wilson borrows $840 for 6 mos. at 6%. How much will he have to repay on the due date?	Same as Average Pace.	D. Wilson borrowed $925 on Feb. 1. How much will he have to repay on the due date, Oct. 1, if the interest rate is 5%?
$640 for 60 days @ 6%. $780 for 2 mos. @ 6%.	Same as Average Pace.	$645.75 for 60 days @ 6%. $813.60 for 2 mos. @ 6%.
$520 for 30, 90, 15, 45 days @ 6%.	Same as Average Pace.	$897.65 for same days.

Content	Teaching Suggestions
Interest for other combinations of days @ 6%	Limit combinations to days taken previously, combined with 6 or 3 days. Show that 6 = 1/10 x 60; 3 = 1/10 x 30; 66 = 60 + 6; 27 = 30 — 3; etc.
Interest at rates other than 6%	Find interest at 6% by 60-day method, then adjust as follows: 5%: subtract 1/6 of 6% 4%: subtract 1/3 of 6% Limit problems to 30, 60, or 90 days, except for above-average pupils.
Interchanging dollars and days (optional)	Show that 60 days' interest on $90 is the same as 90 days' interest on $60. Explain commutative law.
Finding date of maturity and maturity value of notes	Stress importance of knowing exact number of days in each month.
Time given in days	
Time given in months	

Average Pace	Modified Pace	Accelerated Pace
Find the interest on $840 for 66 days at 6%.	Omit.	Find interest for any number of days.
Find interest on $680 for 90 days @ 5%. Solution: $6.80 60 @ 6% 3.40 30 @ 6% 10.20 90 @ 6% 1.70 " 1% 8.50 " 5%	Find interest on $1200 for 60 days @ 5%. Solution: $12.00 60 @ 6% 2.00 60 @ 1% 10.00 60 @ 5%	Find interest for any number of days at any rate up to 6%.
Omit.	Omit.	$90 for 168 days @ 6%.
Find date of maturity of a 30-day note dated May 10; of a 60-day note; of a 90-day note.	30- and 60-day notes only.	Any number of days up to 120.
Find date of maturity of a 1-mo., 2-mos., and a 3-mos. note dated May 10.	Same as Average Pace.	A 1-mo. note dated Mar. 31; Jan. 31.

Content	Teaching Suggestions
Finding maturity value of interest-bearing notes Time stated in days Time stated in months	
Discounting notes Discounting one's own note	Show students that bank discount is interest deducted in advance on borrower's note. Dramatize borrowing at bank.
Discounting a customer's non-interest-bearing note (optional)	If this optional topic is taken, the term of discount should be limited to 60, 45, 30, or 15 days.
Discounting a customer's interest-bearing note (optional)	
Compound interest Interest compounded quarterly on initial deposit	The purpose of this unit is to develop an understanding of concept of compound interest. Avoid introduction of deposits or withdrawals made during the interest period. Emphasize that the common practice of savings banks is to credit interest quarterly on March 31, June 30, Sept. 30, and Dec. 31 on the whole number of dollars on deposit.

Average Pace	Modified Pace	Accelerated Pace
Find maturity value of a $560, 90-day, 6% interest-bearing note.	$800 for 60 days @ 6%.	$943.75 for 90 days @ 6%.
Find maturity value of an $840, 2 mos., 6% interest-bearing note.	Same as Average Pace.	$871.63 for 3 mos. @ 5%.
A. Ganz discounted his own 60-day, $540 note @ 6%. Find the net proceeds.	A $700, 60-day note discounted @ 6%.	An $840, 90-day note discounted @ 5%.
On May 16 we discounted @ 6%, L. Swift's $840, 60-day note dated May 1. Find the net proceeds.	Omit.	Same as Average Pace with May 7 as date of discount.
Omit.	Omit.	On May 31 we discounted A. Bell's $800, 60-day, 6% interest-bearing note dated May 1. Find the net proceeds.
$900 is deposited on Jan. 2 and left in the bank for 1 year. Find balance in bank 1 year later if the bank pays interest at 4% per annum compounded quarterly.	$500 is deposited on Jan. 2 and left in the bank for 6 months. Find the balance on June 30 if the bank pays interest at 4% per annum compounded quarterly.	On Dec. 31, A. Bee's bank balance was $1825.64. He made no deposits or withdrawals during the year. What was his bank balance the following Dec. 31, if his bank pays 4% interest per annum compounded quarterly?

Content	Teaching Suggestions
Interest compounded quarterly on initial deposit, and additional deposit made on 1st day of next quarter	Use interest at 4% per annum (1% per quarter) until students have mastered this topic. Then introduce current rates of interest.
Interest compounded quarterly on initial deposit, additional deposit made on 1st day of next quarter, and withdrawal made on 1st day of following quarter (optional)	Students should be asked to report on the different systems used by savings banks for deposits and withdrawals made during interest periods.
PAYROLLS Finding total hours worked	Show pupils the school time clock and time cards used by teachers. Demonstrate use of clock. Show sample weekly time cards obtained from time clock manufacturers. Drill on determining hours worked from time cards.
Computing earnings at hourly rate: hours × rate	Use pupil's part-time jobs as motivation for class problems. Mimeographed pages taken from a payroll computation book may be used as a time-saving device.

Average Pace	Modified Pace	Accelerated Pace
On Jan. 1 we deposited $900, and on Apr. 1 we deposited another $300. Find the balance on the following Jan. 1 if the bank pays interest at the rate of 4% per year compounded quarterly.	Omit.	Same as preceding problem with additional deposit of $462.47 made on April 1.
Omit.	Omit.	Same as above with withdrawal of $165.93 on July 1.
Time cards should contain such information as: 8:55-12:05 12:58-5:06. Problems may contain ½ and ¼ hours. Penalty for lateness should be presented.	Use only full hours and half-hours in determining hours worked: 9:00-12:00 1:00-4:30.	Same as Average Pace.
Computations may include fractions of an hour (½, ¼, ¾). Find the earnings for 20½ hours at $1.60 an hour; 36¼ hours at $1.50.	Computations should be based on simple combinations of hours × rate: 16 hours @ $1.80; 24 hours @ $1.50.	Same as Average Pace.

Content	Teaching Suggestions
Computing overtime earnings at hourly rate	Discuss reasons for extra compensation for overtime work. The concept of time-and-a-half should be presented. Wage and Hour Division recommendations for computing overtime should be followed. The hourly rate should not be changed for overtime. For compensation-insurance purposes the following procedure is recommended: total hours at regular rate + overtime bonus hours (½ the overtime hours) at the regular rate. Pupils should learn to find the overtime bonus hours, to multiply the total hours by the regular rate, and the overtime bonus hours by the same rate.
Piecework	Discuss industries in which piece work is used as a basis for determining wages. Discuss the advantages and disadvantages of piecework.
Conversion of annual salary to weekly and monthly salary; monthly salary to weekly salary	For Accelerated-Pace pupils establish that there are 13 weeks in a 3-month period; therefore each month consists of 4⅓ weeks.

Average Pace	Modified Pace	Accelerated Pace
Use whole hours only. Compute Brown's earnings for 45 hours at $1.50. Solution: 45 hours × $1.50 = $67.50 2½ hours × $1.50 = 3.75 Total Earnings $71.25	Keep figures simple: 42 hours @ $1.50; 45 hours @ $2.00.	Half hours should be included in total hours worked. Do not include ¼ hours. Use conversion of fractions to decimals to facilitate computations. 45½ hours @ $1.60; 44½ hours @ $1.75.
John completed 120 pieces during the week. If he earned $.65 for each piece he completed, how much did he earn during the week?	Same as Average Pace.	John's pay is computed as follows: $.45 per piece for up to 80 pieces; $.65 per piece for the next 20 pieces; $.85 per piece for all additional pieces. If John made 120 pieces during the week, how much did he earn?
Harris earns $3648 a year. How much does he earn a month? Baron earns $4420 a year. How much does he earn a week?	Same type of problem. Numbers used should be selected so that solutions will involve no remainders.	A typist is offered a job at $275 a month. She can make $65 a week with another firm. Which job pays more?

Content	Teaching Suggestions
Computing hourly rate for salaried employees	Elicit the need for converting weekly salary to an hourly rate.
Commission Fixed amount per unit Per cent of sales Salary plus commission Graduated basis Quota basis	Discuss the advantages and disadvantages of working on a commission basis. Compare commission earnings with straight salary.
Determining take-home pay Social Security Tax (F.I.C.A.)	Discuss purpose of Social Security law and its principal benefits. Use current tables to verify actual computations based on current rates. Discuss limitation of amount taxed ($6,600 in 1967). Subtract F.I.C.A. tax from earnings to find take-home pay.

Average Pace	Modified Pace	Accelerated Pace
Nelson earns $80 for a 40-hour week. Last week he worked 44 hours. How much did he earn, including overtime? Gordon earns $100 a week for a 40-hour week. He took 4 hours off during the week for personal business. What was his salary for the week?	Nolan earns $80 a week. He works a 40-hour week. How much does he earn an hour?	Same as Average Pace.
A vacuum cleaner salesman gets commission of $5 per vacuum cleaner for each of first 5 he sells; $8 for each of next 5; and $10 for all above 10. Last week he sold 22 vacuum cleaners. How much did he earn?	Omit problems on graduated basis and quota.	Same as Average Pace.
Your salary is $55 a week. a. Find your social security tax, using the current rate. b. Use the table to check answer. c. How much is your take-home pay?	Same as Average Pace.	Same as Average Pace. Until this week Brown earned $6,550 this year. This week he earned $145. How much is his F.I.C.A. tax deduction this week? How much is his take-home pay?

Content	Teaching Suggestions
Federal withholding tax	Discuss the purpose of the withholding tax as a means of current payment of income tax. Discuss the meaning of an exemption, using the W-4 form as a basis. Current withholding tax tables should be provided for student use.
New York State withholding tax New York City withholding tax (residents)	Actual tables issued by various tax agencies may be used, or reproductions of single table with all taxes to be withheld.
New York City withholding tax (nonresidents)	Discuss purpose of this tax on nonresidents. Stress that employees pay either the withholding tax as residents or as nonresidents.
New York State disability insurance	Discuss purpose of disability insurance and computation of ½ of 1% of earnings up to $60 a week. Verify computation with use of tables.
Use of payroll form	Use integrated problems reviewing all forms of earnings and tax deductions. Emphasize checking totals of various columns.
Payment to employees by check or currency	Use currency distribution forms.

Average Pace	Modified Pace	Accelerated Pace
Your salary is $55 a week. You are single and claim one exemption. a. How much is federal withholding tax? b. How much is your take-home pay after deducting FICA and withholding taxes?	Same as Average Pace.	Same as Average Pace.
In preceding problem: a. Find N.Y.S. withholding tax and take-home pay after deducting FICA, federal and state withholding taxes. b. Find your N.Y.C. withholding tax and take-home pay after deducting FICA, federal, state, and city withholding taxes.	Same as Average Pace.	Same as Average Pace.
Mr. Jones lives in New Jersey but works in N.Y.C. His salary is $92 a week. How much is his N.Y.C. withholding tax?	Same as Average Pace.	Same as Average Pace.
Problems may involve amounts such as $56.80 and $49.45, requiring the use of a third decimal place.	Computations should be restricted to whole dollars: $48, $37, etc.	Same as Average Pace.
Provide pupils with weekly earnings of employees and have them complete the payroll.	Same as Average Pace.	Payrolls may include deductions for union dues, hospitalization, and savings bond purchases. Payrolls for several weeks may be prepared as basis for individual employee earnings records.

TERM TWO

Content	Teaching Suggestions
INCOME TAXES Federal income tax	Obtain from the Internal Revenue Service, "Teaching Taxes" kit with forms, problems, and posters for classwork. Present the concept that each citizen shares the tax burden according to his ability to pay. Discuss briefly taxes and the budget. Stress sources of revenue and major items in the national budget. Review briefly withholding tax and exemptions which were developed in topic "payroll."
Use of the short form, 1040 A	Provide a form for each pupil. Use overhead projector with a transparency to illustrate use of short form.
Income less than $600: filing for refund	Utilize pupils' experiences and W-2 forms for application phase.

SAMPLE PROBLEMS

Average Pace	Modified Pace	Accelerated Pace
Harry's gross earnings last year were $450, of which $46 was withheld for federal withholding tax. Why should he file a tax return? Prepare the return.	Same as Average Pace.	Same as Average Pace.

Content	Teaching Suggestions
Income less than $5,000: use of tax table	Develop concept of taxation based on ability to pay, as indicated by amount of income and number of exemptions. Discuss who must file a tax return. Have pupils find tax from table provided in tax booklet and have them compare tax with amount withheld to determine amount of refund or additional tax due. Review concept "Pay as You Go" in withholding income tax from wage earners. Discuss why there may be a refund or an additional tax due.
Income of $5,000 but less than $10,000: finding taxable income; use of tax-rate schedule	Continue concept of taxation based on ability to pay. Discuss deductions for contributions, interest expense, taxes and medical expense. Discuss standard deduction in lieu of itemizing deductions. Discuss both the 10% standard deduction and minimum standard deduction. Discuss allowance for exemptions. Stress meaning of term "taxable income." Use tax-rate schedule for single taxpayers and schedule for married taxpayers filing jointly.

Average Pace	Modified Pace	Accelerated Pace
Barry's income last year was $2,400. He has one exemption. How much is his tax?	Same as Average Pace.	Barton earned $4,862.75. He has 4 exemptions. How much is his tax?
Nelson has one exemption. He earned $748 last year. a. How much is his tax? b. Tax withheld was $10.40. Will he be entitled to a refund, or must he pay an additional tax? How much?	Same as Average Pace.	Same as Average Pace.
Howard is single. He earned $7,350 last year. He takes the standard deduction. a. How much is his tax? b. If tax withheld during the year was $946.40, is he entitled to a refund or does he owe additional tax? How much?	Same as Average Pace.	Same as Average Pace.

Content	Teaching Suggestions
Use of the long form, 1040	Discuss limitations of short form to show need for long form.
Finding the total income	Limit sources of income to salaries and interest income.
Finding the tax, using table for income under $5000	Show that tax tables may be used even with long form for incomes under $5000.
Finding taxable income using standard deduction: income $5000 and over	Review concept of deductions for contributions, interest, taxes, and medical expense, and of standard deduction allowable in lieu of itemizing deductions. Explain that standard deduction may not exceed $1,000. Review minimum standard deduction.
	Discuss conditions that must be satisfied for an exemption. Stress that full-time students may be considered exemptions on their parents' income tax return even if students have income over $600 and file own returns.

Average Pace	Modified Pace	Accelerated Pace
Adams earned $3,456 last year. His interest income on money on deposit in savings banks was $234.50. What was his total income?	Same as Average Pace.	Same as Average Pace.
In preceding problem find tax directly from the table.	Same as Average Pace.	Same as Average Pace.
Harrison's salary for the year was $6,328 and interest on his bank deposits amounted to $250. He is single. He elects to take standard deduction. How much is his taxable income?	Same as Average Pace.	Same as Average Pace.
Bronson had total income of $12,540.60. He is married and takes standard deduction. He has 5 exemptions. How much is his taxable income?	Same as Average Pace.	Additional exemptions for taxpayer and spouse if 65 or over or if blind, may be introduced, as follows: Bronson earned a salary of $11,234. He had interest income of $345. He and his wife are both over 65 years old. He takes standard deduction. He has no dependent children. How much is his taxable income?

Content	Teaching Suggestions
Finding the tax, using tax-rate schedule	Develop an appreciation of progressive tax structure, why tax rate at each bracket increases, and how basic amount in each bracket is computed. Have students prepare long form once or twice for acquaintanceship only. Work together when doing this. Treat concept of joint return on an elementary level. Determine amount of tax to be paid by a husband and wife with identical taxable incomes if they file individual returns and if they file a joint return.
Finding taxable income when deductions are itemized	Treat this topic simply as an arithmetic problem of finding total amount of contributions, interest paid, taxes, and medical expense. Avoid technical considerations of allowable or non-allowable deductions. Avoid technical aspects of medical deduction.

Average Pace	Modified Pace	Accelerated Pace
Borden's taxable income for the year (after deductions and exemptions) was $5,254. If he is single, how much is his income tax? If tax withheld during the year for federal withholding tax amounted to $1,040, is he entitled to a refund, or must he pay an additional tax? How much?	Same as Average Pace.	Same as Average Pace.
Borden's friend, Smith, also had a taxable income for the year (after deductions and exemptions) of $5,254. If Smith is married and files a joint return, how much is his income tax? If tax withheld during the year for federal withholding tax amounted to $780, is he entitled to a refund, or must he pay an additional tax? How much?	Same as Average Pace.	Same as Average Pace.
Benson's income was $6,542. His allowable deductions were: Contributions $274.35 Interest expense 46.32 Taxes 123.25 Medical and dental 231.18 a. Find the total deductions. b. Should he take standard deduction or itemize deductions? Why? c. Find his taxable income, if he is single.	Same as Average Pace.	Same as Average Pace, but provide details of contributions and taxes.

Content	Teaching Suggestions
Composite problems	In each of these problems, discuss (a) whether to use short or long form, and (b) whether to take standard deduction or itemize deductions.
New York State income tax	Provide pupils with actual IT-200 short forms and IT-200-I (instructions).
IT-200 — Short Form	Discuss who must file a tax return. Discuss why a student should file a return.

Average Pace	Modified Pace	Accelerated Pace
Miller is married and has 2 children. His income from salary was $8,265.40. He had interest income from savings banks of $210.38. Federal tax withheld was $754.00. His itemized deductions are: Contributions $275.50 Interest expense 32.26 Taxes 263.95 He files a joint return with his wife. a. Which tax return must he file? Why? b. Should he list his deductions or take standard deduction? Why? c. Find his income tax. d. Is he entitled to a refund, or must he pay an additional tax? How much?	Gregory is single. His income was $2,340.50 from salaries and $23.68 from savings bank interest. His W-2 showed $239.20 income tax withheld. His itemized deductions show: Contributions $165.00 Interest expense 12.75 Taxes 174.18 a. Should he list his deductions or take standard deduction? Why? b. Should he file short or long form? Why? c. Find his taxable income. d. Find his income tax. e. Is he entitled to a refund, or must he pay additional tax? How much?	Same as Average Pace.

Content	Teaching Suggestions
Finding the tax from the table	Review procedure for finding total income and meaning of exemptions. Establish meaning of statutory credit. Deduct amount of credit from amount of tax shown on table, to find actual tax. Use pupils' earnings and taxes withheld as basis for class discussion.
IT-201 — Long Form Finding the tax from tax-rate schedule	Obtain copies of tax return. Avoid consideration of all technical matters. Elicit similarity between federal and state returns. Begin with income shown on federal return, then take standard deduction and allowance for exemptions to find taxable income. Use rate schedule to find tax, deduct statutory credit, and compare tax with amount withheld to find refund or tax due. Stress graduated scale of rates.

Average Pace	Modified Pace	Accelerated Pace
George earned $2,312 last year. He has one exemption. a. Use the table to find his New York State tax. b. Deduct the statutory credit to find his actual tax. c. If his tax withheld during the year totaled $10.40, how much is his refund or additional tax?	Same as Average Pace.	Same as Average Pace.
Baker earned $5,670. He has 3 exemptions, and takes the standard deduction. How much is his N.Y.S. taxable income?	Same as Average Pace.	Same as Average Pace.
Chester's N.Y. taxable income (after deductions and exemptions) is $4,540. a. How much is tax from tax rate schedule? b. Chester's statutory credit is $10. Find his actual tax. c. Chester's tax withheld was $154.40. How much is his additional tax or refund?	Charles' N.Y. taxable income was $1,400. a. How much was his tax as computed from tax-rate schedule? b. Charles' statutory credit was $10. How much is his tax after deducting credit? c. Charles' tax withheld was $24. How much is his additional tax or refund?	Cooper's N.Y. taxable income was $7,523.45. a. Compute his tax using the tax-rate schedule. b. Cooper's statutory credit was $25. Find his tax bill. c. Cooper's tax withheld was $267.40. How much was his additional payment or refund?

Content	Teaching Suggestions
New York City income tax	Obtain copies of tax return. Limit topic to the purpose of this tax and application of the tax rates.
INSURANCE Property insurance Finding premium for one year	Discuss concept of insurance. Illustrate by setting up an insurance company in the class to insure against loss of books. Discuss purpose of fire insurance. Consider terms commonly used, such as premium, policy. Review division by 100.
Finding the premium for 3 or 5 years	Discuss special rates for policies issued for more than one year. Use current rates taken from actual policies. Discuss factors considered in arriving at rates.
Finding amount due under coinsurance clause	Discuss purpose of coinsurance clause. Emphasize the need to insure property for 80% of its value to avoid becoming a coinsurer.

Average Pace	Modified Pace	Accelerated Pace
Donovan's N.Y. taxable income, after allowable deductions and exemptions, is $4,800. a. How much is his New York City income tax? b. If tax withheld was $44.20, how much is his refund or additional tax?	Same as Average Pace.	Same as Average Pace.
Holmes has a $15,000 fire insurance policy on his house. The annual rate is 14¢ per $100. Find the premium.	Same as Average Pace.	Smith has a $17,000 house. He insures the house for 80% of its value. The cost of fire insurance is 14¢ per $100, and a 3-year policy is 2.7 times the annual rate. What would he save by buying the 3-year policy?
Holmes can buy a 3-year policy for 2.7 times the annual rate. What would the premium be?	Same as Average Pace.	See preceding problem.
Thomas insured his $25,000 house for $15,000. The policy contains an 80% coinsurance clause. Fire caused damage of $2,000. How much should insurance company pay?	Same as Average Pace.	Same as Average Pace, but change value of house to $23,000.

Content	Teaching Suggestions
Automobile insurance Types Finding the premium	Discuss meaning of liability, property damage, comprehensive, collision insurance. Establish minimum amount of public liability and property damage insurance required to register a car in N.Y.S. Discuss required insurance against uninsured motorists. Discuss factors that affect rates: use of vehicle, geographical location, type of car, age and sex of driver, etc. Rationalize discounts for safe drivers, penalty payments for bad risk drivers. Discuss reason for high rates for male drivers under 25. Use current tables obtained from insurance companies. Demonstrate applicability of commutative law in multiplication. Develop meaning of "$100 deductible" clause for collision insurance.
Life insurance Types Finding the premium	Establish meaning of terms: ordinary life, term, endowment, limited-payment life. Provide pupils with tables of typical rates for each type. Discuss advantages and disadvantages of each type. Obtain literature from savings banks and life insurance companies.

Average Pace	Modified Pace	Accelerated Pace
Tom is a male driver under 25. He must pay $343 for 10/20 liability insurance according to table of rates. If he buys a 50/100 policy, he must pay 30% more. How much would premium be for the 50/100 policy, if Tom has 2 points against him and must therefore pay a penalty rate of 50% more?	Same as Average Pace, but omit either the penalty points or the additional insurance.	Provide students with table of rates. Have pupils decide on a basic rate determined from the table, and then solve problem. Use problem shown in Average Pace but have students apply the table to find premium of $343 on basis of Tom's age and place where car is garaged.
An ordinary life insurance policy at age 20 costs $14.75 per $1,000. What would premium be for a $15,000 policy?	Same as Average Pace.	Consult the tables of rates at age 20. If Bill wishes to pay no more than $400 a year for life insurance, what is the maximum amount of insurance of each type he can afford, to the nearest $1,000?
You buy a $10,000 20-yr. endowment policy at 25 years of age. The premium is $44.72 per $1,000. a. What are total premiums you would pay during the next 20 yrs.? b. How much would you receive at 45 years of age? c. How much more is this than you paid in? Why can the company afford to do this?	Same as Average Pace.	

Content	Teaching Suggestions
INSTALLMENT BUYING Finding the monthly payment	Develop advantages and disadvantages of buying on the installment plan. Introduce problems requiring no down payment; then proceed progressively to down payment, sales tax, finance charge expressed as a fixed amount, trade-in. Illustrate and analyze current newspaper advertisements. Note that where there is a trade-in, the sales tax is computed on the balance due.
Finding the number of payments to liquidate an installment debt	

Average Pace	Modified Pace	Accelerated Pace
Mrs. Egan bought a refrigerator for $275, plus sales tax. She is required to pay the sales tax at once, plus a down payment of $25, and to pay balance, plus a finance charge of $15, over the next 12 mos. a. How much money does she need at time of purchase? b. How much must she pay each mo.? c. What is total cost of refrigerator?	Mrs. Egan bought a refrigerator for $275. She is required to make a down payment of $25, and to pay unpaid balance, plus a finance charge of $10. over the next 10 mos. How much must she pay each month?	Mr. Jones bought a new car for $3,200. He was allowed $400 on his old car. He is required to pay sales tax at once. He will pay balance, plus $275 for insurance and $350 finance charge, over next 30 mos. a. How much is amount of sales tax? b. How much must he pay monthly?
A store advertises a furniture set for $250. Terms: $50 down and balance, plus service charge of $10, to be paid at $20 a mo. a. How many mos. will it take to complete payment? b. How much will final payment be?	A store advertises a furniture set for $240. Terms: $50 down. Balance, plus a service charge of $10, must be paid at $20 a mo. How many months will it take to pay?	Same as Average Pace.

Content	Teaching Suggestions
Comparison of cash price and installment price Borrowing money to pay cash	Discuss institutions where consumer can borrow money at moderate rates. Compare rates charged by various lending agencies. Show that a rate of 2½% per month on unpaid balance is equivalent to an annual rate of 30%. Show that a 6% rate charged by a bank on a loan paid off in installments represents a true rate of about 12% on unpaid balance.
PROFIT AND LOSS	
Finding the selling price Markup based on cost	Omit determining the selling price when markup is based on selling price.
Finding percent of profit Markup based on cost	Develop need to convert amount of markup to a percent in order to make comparisons.
Markup based on selling price	Compare rate of gross profit based on cost and on selling price.

Average Pace	Modified Pace	Accelerated Pace
A TV set may be bought for $200 cash, or $40 down and the balance in 12 installments of $15 each. Which method costs more and by how much? Mrs. Jones has only $40, but would like to buy for the cash price. a. If she borrows balance of $160 at 6% for 1 yr., what would be total cost of TV? b. Would cost be more or less than installment price? c. How much more or less?	A TV set may be bought for $200 cash, or for $40 down and 12 installments of $15 each. a. How much would set cost on installment plan? b. How much would be saved if you buy for cash?	Same as Average Pace.
A dealer buys radios for $25 each. His markup is 40% of cost. At what price should a radio be sold?	Same as Average Pace.	A dealer paid $1850 for 30 radios. His markup is 40% of cost. At what price should each radio be sold?
A refrigerator costs $225. It sells for $315. What is rate of markup based on cost?	Same as Average Pace.	A dealer buys a machine for $300, less 10%. He sells it for $360. What is his rate of profit based on cost?
A dealer buys an article for $60. He sells it for $80. What is the percent of profit based on (a) selling price? (b) cost?	Same as Average Pace.	In a special sale a washing machine sells for $350, less 25%. Cost to dealer is $200. What is his rate of profit based on (a) selling price? (b) cost?

Content	Teaching Suggestions
Finding the net profit Converting to percent of sales dollar	Emphasize the need for considering expenses before determining the net profit. For bright pupils introduce problems involving a gross profit with a net loss; illustrate visual presentation of the sales dollar.
DEPRECIATION USING STRAIGHT-LINE METHOD	Define depreciation. Compare depreciation with other business expenses such as wrapping paper, postage, gasoline, etc.
Given cost and estimated life No scrap value	
With scrap value	Discuss terms: trade-in value, scrap value, junk value.

Average Pace	Modified Pace	Accelerated Pace
A dealer's sales in 1964 were $120,000. Merchandise sold cost him $80,000. His expenses were $20,000. Find: a. gross profit. b. net profit. c. percent of cost of merchandise sold, based on sales. d. percent of expenses based on sales. e. percent of net profit based on sales.	Same as Average Pace.	Same as Average Pace, except itemize the expenses, thereby requiring use of an Income Statement form.
A machine costs $5,000. It will last eight years and then be worthless. How much does it depreciate each year?	Same as Average Pace, but use a five-year life.	A building costs $17,000. It will have an estimated life of 40 years. Find the annual depreciation.
A car costs $3,200. We expect to use the car for seven yrs.; it will then be worth $400. What is annual depreciation expense?	A car costs $3,300. It will have useful life of 5 yrs. and then have a trade-in value of $300. What is depreciation expense each year?	A machine costs $27,500 and will have an estimated useful life of seven years and a scrap value of $500. Find the annual depreciation.

Content	Teaching Suggestions
Given cost and rate of depreciation	
Given cost and annual depreciation	
STOCKS AND BONDS	Compare investing in stock with keeping money in a savings bank.
Stocks	
Purchase and sale	Discuss meaning of "stock" and how stock originates.
	Discuss function of the stock exchange and how prices are reported to the public. Obtain booklets prepared by N.Y. Stock Exchange.
	Use financial section of daily newspaper to find current prices, dividends, etc.
	Review decimal equivalents of eighths. Review multiplication by 100.
	Omit computations of broker's commission and transfer taxes; give expenses of buying in determining cost and expenses of selling in determining net selling price.

Average Pace	Modified Pace	Accelerated Pace
A truck costs $8,000. It depreciated 25% this year. a. How much did it depreciate? b. How much will it be worth at end of two years?	Same as Average Pace. How much will it be worth at the end of one year?	A machine costs $17,500. The depreciation rate is 12½% a year. a. What is amount of annual depreciation? b. How much will the machine be worth at end of 2½ years?
Machinery that costs $5,000 depreciates $500 each year. What is percent of depreciation?	Same as Average Pace.	Same as Average Pace.
Mr. Jones bought 100 shares of Union Motor at 47⅜. He paid the broker a commission of $42.69. Find the cost of his investment.	Same as Average Pace.	Mr. Smith bought 75 shares of Union Motor at 78⅜. He paid a commission of $42.88. He also bought 100 shares of Western Pacific at 43⅛ and paid a commission of $40.56. Find total cost of these purchases.
Mr. Evans sold 30 shares of Star Cola at 77⅞. He paid a commission of $28.36 and transfer tax of $1.50. Find proceeds of the sale.	Same as Average Pace.	Same as Average Pace.

Content	Teaching Suggestions
Finding gain or loss on sale of stock	Include some problems that result in a loss.
Dividends	
Finding dividend income	Establish concept that dividends are a distribution of profit to the shareholders; that they are usually paid quarterly; that they are generally expressed as cents per share.
Finding the yield	Yields from dividend income should be compared with savings bank interest rates. The annual rate of return should be expressed to the nearest tenth percent.

Average Pace	Modified Pace	Accelerated Pace
Mr. Green bought 60 shares of Northern Foods at 45⅞. Broker's commission was $30.76. He later sold the stock at 56½. He paid the broker a commission of $33.95, and he paid transfer tax of $3.00. Find the gain or loss.	Mr. Green bought 100 shares of Northern Foods at 45. The broker's commission was $41.50. He later sold the stock at 47½. He paid $47.75 for commission and transfer tax. Find his gain or loss.	Mr. Oliver bought 200 shares of Eastern Silver at 42⅜. Broker's commission was $80.38. He later sold 50 shares at 38¾. He paid the broker a commission of $24.38, and he paid transfer tax of $2.50. How much did he gain or lose on shares sold?
Mr. Thomas owns 100 shares of Star Industries. Last year he received four quarterly dividends of 80¢ per share. What was his income from this stock for the year?	Same as Average Pace.	Mr. Drake owns 250 shares of Brooklyn Utility Company. Last year he received quarterly dividends of 30¢, 30¢, 32½¢, 32½¢. What was his income for the year from this source?
Mr. Carmine invested $8,000 in stock of Midwood Railroad. His dividends last year amounted to $475. What percent did he earn on his investment?	Same as Average Pace. Use $400 income.	Mr. Stone is considering buying 100 shares of Banner Foods at 55, paying dividends of 45¢ quarterly, or 100 shares of Superior Foods at 86, paying 50¢ quarterly. What rate of return does each stock yield? (Omit commissions.)

Content	Teaching Suggestions
Bonds	Teach the difference between shares of stock and bonds.
Finding the cost Finding the selling price Finding the income	Distinguish between par value and market value of bonds. Refer to price quotations in newspapers. Elicit reasons for difference between market price and par value for specific bonds. Emphasize that price of a bond is quoted as a percent of par value. Omit computations of accrued interest to date of purchase or date of sale.
Finding the rate of income	Compare yields on bonds with savings bank interest rates and yields on stocks. Yields should be found to the nearest tenth percent.

Average Pace	Modified Pace	Accelerated Pace
Mr. Simpson bought 10 Consolidated Utility bonds, 4¾%, par value $1,000 each, at 103½. Buying commission was $25. a. Find cost of these bonds. b. Find total annual income.	Omit.	Same as Average Pace. John Darwin bought 25 Maine Central 6% bonds, par value $1,000 each, at 96⅞. He paid a buying commission of $62.50. He later sold bonds at 102¼ and paid a selling commission of $62.50. How much did he gain or lose?
Mr. Jones bought a Superior Gas & Electric 5% bond, par value $1,000, at 95, plus a buying commission of $2.50. a. What was cost of bond, including commission? b. What income will Mr. Jones receive each yr.? c. What rate of income will he receive?	Omit.	Same as Average Pace. Newspapers showed these prices for C.D.&E. bonds: 2¾s71, 88¼; 3⅜s73, 87⅞. a. Why should the 2¾% bonds cost more than the 3⅜% bonds? b. Why does date of maturity of bond affect price and yield?

Content	Teaching Suggestions
OWNING A HOME Financing the purchase of a house	Motivate topic by eliciting advantages and disadvantages of owning a home as compared to renting. Explain such terms as mortgage, mortgagor, mortgagee. Consider function of F.H.A. In first few problems have students find the interest on unpaid balance to illustrate declining amount of each payment. Then consider desirability of paying a uniform monthly amount. Refer to tables for determining monthly repayment of principal and interest.

Average Pace	Modified Pace	Accelerated Pace
On May 1, Mrs. Burns bought a house and lot for $23,500. She paid $3,500 down and secured a 20-yr. mortgage for the balance. She must make semi-annual payments on mortgage, plus interest at 5% on unpaid balance. a. How much must she pay toward mortgage on Nov. 1? How much interest must she pay? b. How much must she pay toward mortgage on the following May 1? How much interest must she pay?	Same as Average Pace.	Same as Average Pace, except change price to $25,000.
On May 1, Mrs. Burns bought a house and lot for $23,500. She paid $3,500 down, and secured a 20-yr. 5% mortgage for the balance. a. Use the table to find how much she must pay each month for interest and amortization on mortgage? b. How much has she paid after 20 yrs.? c. How much interest has she paid over 20 yrs.?	Same as Average Pace.	Same as Average Pace, except change price to $25,000.

Content	Teaching Suggestions
Real Estate Taxes	Explain meaning of assessed valuation and of tax rate.
Finding the tax rate	Use simple figures to give students understanding of how tax rate is determined.
Finding tax cost	Establish various ways of expressing the rate: as a percent, an amount per $100, an amount per $1,000. Use current tax rates.
Cost of Maintenance	Review depreciation as a cost of operation.
Finding the monthly cost of maintaining a house	Elicit concept that depreciation is applied only to building, not to land.

Average Pace	Modified Pace	Accelerated Pace
Officials of Hillsview approved an estimated budget of $100,000 for maintenance and improvements for coming year. Assessed value of land and property is $5,000,000. What tax rate should be levied?	Omit.	Same as Average Pace.
Walter Major buys a home assessed at $14,800. Tax rate is $4.75 per $100. What is Major's tax?	Same as Average Pace.	Same as Average Pace.
W. Isaacs bought a cottage for $7,000. He paid $2,000 in cash and gave a ten-year 6% mortgage for the balance, payable in annual installments of $500. What is monthly cost of maintaining house if first year's expenses were: Taxes $195 Insurance 55 Heat 150 Repairs 50 Interest ? Depreciation of building was 3% of $4,800, (cost of building, excluding land).	T. Low's expenses for the first year on his home were: Taxes $195 Insurance 55 Heat 150 Repairs 50 Interest 300 Depreciation of building 150 What is the monthly cost of maintaining the house?	Same as Average Pace.

Content	Teaching Suggestions
Comparison of costs of renting vs. owning a home.	Consider the interest lost on savings withdrawn for investment purpose.
Owning a two-family house.	Explain and discuss advantages and disadvantages of buying a two-family house.

Average Pace	Modified Pace	Accelerated Pace
Same as preceding problem with addition of: W. Isaacs withdrew money for the down payment from his savings account which earned 5% interest. He could have rented the cottage for $1200 for the year. Which was cheaper—renting or buying? How much cheaper?	Same as preceding problem with addition of: When Mr. Low bought his home he withdrew $2000 for the down payment from his savings account which earned 5% interest. He could have rented the cottage for $1,200 for the year. Which was cheaper—renting or buying? How much cheaper?	Same as Average Pace.
Smith owns a two-family house. He rents one apartment for $160 a month and lives in the other apartment. His yearly expenses are: Taxes $320 Insurance 160 Heat 600 Repairs 450 Mortgage Interest 500 Depreciation of building 370 What does it cost Smith to live in his apartment each month?	Smith owns a two-family house. He rents one apartment for $160 a month and lives in the other apartment. His annual expenses are $2400. What does it cost Smith per month to live in his apartment?	Same as Average Pace, except give depreciation as a percent of cost of building, and interest as a percent of mortgage.

REFERENCES FOR TEACHERS

The world of business is constantly changing. The alert teacher of business subjects is aware of the fact that textbooks cannot provide up-to-date information in areas that change constantly, such as tax laws, interest rates, stock prices and yields, etc. The daily newspaper and weekly news magazines provide summaries of the latest changes and indicate where complete information may be obtained. Some specific sources of information are listed below, but the list is not all-inclusive. Teachers may also obtain information through telephone calls or personal visits to insurance brokers, stockbrokers, banks, insurance companies, local real estate agents, etc.

Government Agencies

N.Y.C. Department of Finance, 354 Broadway, New York, N.Y. 10013 (964-5900)

Tax forms and instructional materials for the New York City income tax and the earnings tax may be obtained, and also information related to the real estate tax.

N.Y.S. Department of Labor, 80 Centre Street, New York, N.Y. 10013 (CO 7-9800)

For information on wages and hours, and unemployment insurance.

N.Y.S. Department of Law, 80 Centre Street, New York, N.Y. 10013 (CO 7-9800)

For educational materials on installment sales contracts.

N.Y.S. Department of Taxation and Finance, 80 Centre Street, New York, N.Y. 10013 (CO 7-9800)

Income tax forms and instruction sheets may be obtained, as well as sales tax forms, instruction sheets, and booklets.

N.Y.S. Workmen's Compensation Board, 50 Park Place, New York, N.Y. 10007 (DI 9-4000)

Booklets on disability insurance and workmen's compensation insurance may be obtained.

U.S. Department of Health, Education, and Welfare. Social Security Administration. (Consult telephone directory for local office.)

All types of booklets may be obtained at the local district office.

U.S. Treasury Department, Internal Revenue Service. (Consult telephone directory for local office.)

Tax forms, booklets for student use, instruction sheets, and a booklet explaining the tax regulations may be obtained. The Internal Revenue Service usually asks each school how many booklets are needed for teacher and student use. Wall charts are also available.

Private Agencies

Better Business Bureau of Metropolitan New York, 220 Church Street, New York, N.Y. 10013 (349-0470)
More than 50 educational booklets of all types may be obtained.

Dun & Bradstreet, Inc., 99 Church Street, New York, N.Y. 10007 (DI 9-3300)
Various types of materials and booklets concerning credit.

Insurance Information Institute, 110 Williams Street, New York, N.Y. 10038 (BE 3-7650)
Information and educational materials on all types of insurance, except life, accident, and health.

Life Insurance Institute, 277 Park Avenue, New York, N.Y. 10017 (922-3000)
Information and materials on life, accident, and health insurance.

New York Stock Exchange, Investors Information Department, 11 Wall Street, New York, N.Y. 10005 (HA 2-4200)
Printed booklets of various types; also motion pictures.

Textbooks

FUNDAMENTALS OF MATHEMATICS

NOTE: The teacher of business mathematics should refer to the textbooks used by his students in the lower grades to familiarize himself with the approaches used. A representative sampling of new books is listed:

Banks, J. Houston. LEARNING AND TEACHING ARITHMETIC. Boston: Allyn and Bacon, 1964.
A complete text for the teacher.

Bell, Clifford; Hammond, Clela; and Herrera, Robert. FUNDAMENTALS OF ARITHMETIC FOR TEACHERS. New York: Wiley, 1962.
Emphasizes concepts of the new mathematics.

Clarkson, Donald R. and Hansen, Robert S. UNDERSTANDING TODAY'S MATHEMATICS. Hamden, N.J.: Shoe String Press, 1964.
An introduction to the basic vocabulary and concepts of the new mathematics.

Fahnestock, James D. COMPUTERS AND HOW THEY WORK. New York: Ziff-Davis, 1959.
In addition to an explanation of the basic principles of computers, a chapter on computer arithmetic is of particular interest.

Grossnickle, Foster E. and Brueckner, Leo. DISCOVERING MEANINGS IN ELEMENTARY SCHOOL MATHEMATICS. New York: Holt, Rinehart and Winston, 1963.
Older editions of this book were entitled HOW TO MAKE ARITHMETIC MEANINGFUL.

Hallacy, D. S. COMPUTERS: THE MACHINES WE THINK WITH. New York: Harper and Row, 1962.
An explanation of binary arithmetic is given on pages 96-120.

Mueller, Francis. ARITHMETIC: ITS STRUCTURE AND CONCEPTS. Englewood Cliffs, N.J.: Prentice-Hall, 1964.
A complete exposition of the arithmetic of the new mathematics.

BUSINESS MATHEMATICS (H.S. LEVEL)

Feldman, Harold and Hindle, John. MATHEMATICS IN BUSINESS. Boston: Allyn and Bacon, 1963.

Huffman, Harry; Twiss, Ruth M.; and Whale, Leslie J. ARITHMETIC FOR BUSINESS AND CONSUMER USE. New York: McGraw-Hill, 1962.

Kanzer, Edward and Schaaf, William. ESSENTIALS OF BUSINESS ARITHMETIC. Boston: Heath, 1960.

McNelly, A. E.; Adams, L. W.; and Olson, Milton. BUSINESS AND CONSUMER ARITHMETIC. Englewood Cliffs, N.J.: Prentice-Hall, 1964.

Piper, Edwin and Gruber, Joseph. APPLIED BUSINESS MATHEMATICS. Cincinnati: Southwestern Publishing, 1965.

Rosenberg, R. Robert and Lewis, Harry. BUSINESS MATHEMATICS. New York: McGraw-Hill, 1963.

BUSINESS MATHEMATHICS (COLLEGE LEVEL)

Feldman, Harold and Hindle, John. MATHEMATICS OF BUSINESS AFFAIRS. Boston: Allyn and Bacon, 1963.
This text is intended for college freshmen and sophomores.

Snyder, Llewellyn R. ESSENTIALS OF BUSINESS MATHEMATICS. New York: McGraw-Hill, 1958.
An excellent reference book. Includes an explanation of overtime excess pay computation as required for workmen's compensation insurance and the wage-and-hour law, and as recommended in this syllabus.

Other References

Caplovitz, David. THE POOR PAY MORE: CONSUMER PRACTICES OF LOW-INCOME FAMILIES. New York: Free Press of Glencoe, 1963.

This report of the Bureau of Applied Social Research of Columbia University gives an insight into the buying practices of the poor and provides background for discussion of certain topics, such as installment buying.

Lasser, J. K. YOUR INCOME TAX. New York: Simon and Schuster. Published annually. Includes references to court decisions as well as to the federal tax law.

NEW YORK STATE SALES AND USE TAX LAW WITH EXPLANATION. Chicago: Commerce Clearing House, 1965.

STATE TAX HANDBOOK. Chicago: Commerce Clearing House. Published annually.

U.S. MASTER TAX GUIDE. Chicago: Commerce Clearing House. Published annually.